

ON  
THE EARLY ORGANISATION  
OF  
COAGULA  
AND  
MIXED FIBRINOUS EFFUSIONS, UNDER CERTAIN CONDITIONS  
OF THE SYSTEM.

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It has been noticed by some intelligent pathologists, that in cases of inveterate scurvy, the blood contains, relatively to its other constituents, a larger proportion of fibrin. It is well known, also, that besides the pathognomonic, spongy, and bleeding gums, large ecchymosed blotches make their appearance under the integuments, and extravasations of blood in various deeper-seated situations.

In a paper published in vol. xxiii. of the Transactions of this Society, I referred to a large coagulum, *extravasated*, as I conceived, beneath the periosteum of the tibia of a man who died of scurvy on board the Dreadnought Hospital ship, and which coagulum had been beautifully injected by Mr. Busk. I offered this specimen in proof of the rapidity of the organisation of the fibrinous materials

of the blood, in certain cachectic conditions of the system. The fact of the organisation in this case rested solely upon the perfection of the injection, the absence of any extravasation of the vermilion, and the form and peculiarity of type of the new vessels.

Within the last few weeks a Lascar died of the same disease, on board the Dreadnought, in whose knee-joint were found many coagula, some adherent to the reflected synovial membrane surrounding the cartilages of the femur and tibia, and some loose in the cavity of the joint. The limb having been very successfully injected by Mr. Busk, the attached coagula were found to be permeated with new and numerous capillary vessels.

In Mr. Travers's recent and beautiful monograph upon inflammation, that gentleman expresses a doubt as to the character of the effusion in the former case referred to by me, and inclines to the belief, that the injected mass was rather a fibrinous effusion, mixed with the colouring principle of the blood, than a true extravasation, and that the injected canals were the original vessels between the periosteum and the bone, stretched and separated by the effused fibrin. Mr. Busk also conceived that the specimen consisted, in part at least, of effused fibrin, but he maintains the new formation of the injected vessels.

Not relying, therefore, in this more recent case, solely upon the fact of the clot having been injected, I proceeded to a microscopical examination of the

morbid parts, before they had been altered by immersion in spirit of wine.

The coagula presented the appearance of dark but firm clots, and upon being viewed beneath the microscope, their colour was found to depend upon an infinity of red blood disks in an entire state, mingled with fibrinous globules. The firmness of the masses, however, was due to the advancing organisation of the fibrin itself, the fibrinous cells being found in all stages, from the granulated sphere to the caudated cell, ultimately developing into filamentous tissue.

There were—

1. The exudation or fibrinous corpuscles, spheroidal and granular.

2. Nucleated cells—oval with excentric nuclei and nucleoli.

3. Cells elongating in one direction and becoming caudate.

4. Cells more elongated, and the tails occasionally bifid.

5. Cells drawn out into a filamentous prolongation at either end. And,

Finally, their conversion into simple wavy filaments.

At first the cells were filled with granular matter, as well as with their large nuclei; but as they increased and became elongated, the nuclei diminished, and the granular matter was less abundant: at length the nuclei nearly disappeared, and the filaments became clear. It should be added, that all

these varieties of cell development were seen in one and the same preparation, and at the same time.

It was to the interlacement of these caudate cells and filaments, that the firmness and definite outline of the coagula were due ; and this description exhibits the true progressive organisation of the living germs, which *precedes*, as I believe, the formation of new vessels.

In corroboration of this last remark, I may observe the curious fact, that in the loose coagula found in this same joint, there were not only present those appearances, described by Mr. Gulliver, as due to the simple coagulation of blood out of the vessels, viz. its fibrillation intermixed with blood disks and fibrinous globules, but a distinct stage in advance, or an attempt at progressive organisation, although the coagula were loose in the joint, and unattached to any living tissue.

Even here, a few caudate cells were found, intermingled with coagulated and fibrilated blood, enough, however, to show that the law of vitality impressed upon the cell germs was in action, after all direct connection with living tissue had ceased, and when it is obvious no new vessel could have been formed within the mass. This is a point that requires extended observation, and may have some connection with the obscure subject of the production of loose cartilages, sometimes found in joints and bursal cavities.

It is a matter of much interest to determine, whether the fibrinous materials of the blood, observed

in the *attached* coagula, were effused during a process analogous to chronic inflammation, the blood disks being the product of *new vessels* afterwards ruptured by the *vis-a-tergo*; or whether, during a state of engorgement from feeble systemic circulation, *the original vessels* became torn, and effused their contents.

The blood in scurvy, as already mentioned, is highly fibrinous; and if extravasated within the living body, may not the fibrin coagulate into aggregation corpuscles? or may not the *white* particles of the blood effused with the red disks undergo those organic changes which seem to be the earliest efforts at organisation?

It has been observed by M. Mandl, that "*globules fibrineux*" augment in number on the port-object of the microscope, and he considers them produced by the coagulation of the fibrin formerly dissolved in the *liquor sanguinis*. It is clear, however, that whether they be effused by a process analogous to chronic inflammation, or as a true extravasation in the first instance, the presence of the red blood disks (certainly the production of ruptured vessels) in sufficient numbers to render the fibrinous mass closely analogous to, or imitative of, a true coagulum, does not prevent the first process of cell development, and the subsequent production of new vessels within the mass.

The fungous and bleeding tumours of the gums in scurvy are organised growths, however produced, and are probably of the same type as these morbid

products in the knee joint. Mechanical causes may operate to produce rupture of the gingival vessels, and the highly fibrinous blood coagulates, and rapidly becomes organised, increases, and forms the spongy granulations observed in this disease.

It is not, however, now contended, nor was it in my former paper, *that ordinary extravasations of blood in the healthy body* become organised, because the vitality of surrounding parts is higher than that of the blood so effused, and the absorbents, under such conditions, effect their ordinary changes in consequence of a tendency to disintegration, rather than to an advanced development of the effused blood.